EPSC-DPS Joint Meeting 2019

Communicating Planetary Defense To The Public

Leveraging and Sharing Worldwide

9.18.2019 | Phil Davis, Alice Wessen and Veronica McGregor
Jet Propulsion Laboratory, California Institute of Technology

The Challenge

Most of what the public knows about planetary defense comes from movies and television — and it's mostly wrong. **We can change that.**

- NASA has a powerful network of communications platforms that reach people where they are …
  - On the Internet … on any device and any platform ...
  - In community centers and libraries …
  - In classrooms …
  - And in science centers and museums
- We inspire and educate, reduce fear and promote understanding.

Engagement On the Web

Real-Time Communications

Asteroid Watch

1.2 million followers: Dedicated social media account for communicating planetary defense information in real time.

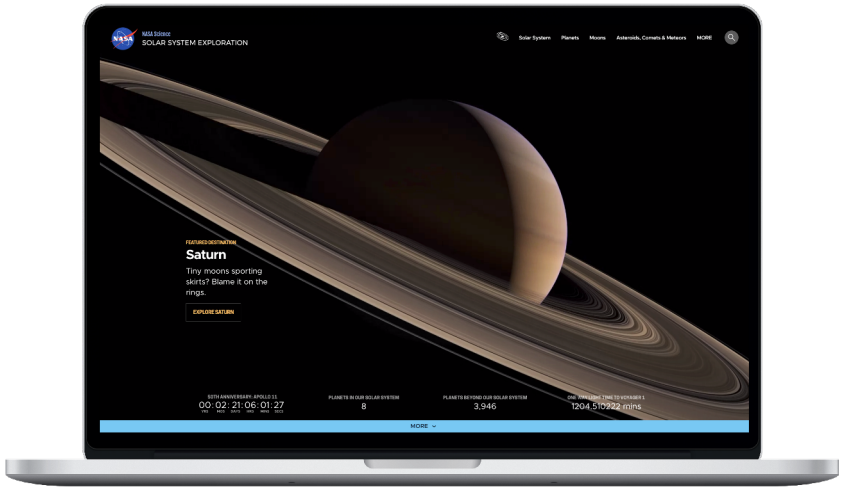
https://twitter.com/AsteroidWatch

The account is supported by the data-driven CNEOS website, JPL's Asteroid Watch web page and NASA's Planetary Defense Coordination Office section of the NASA Portal.

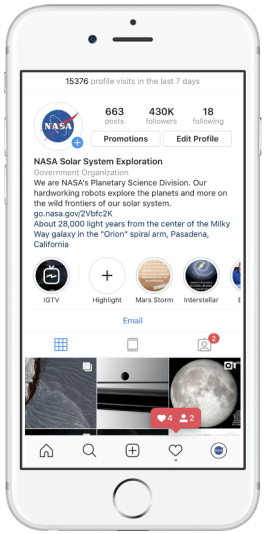
- https://cneos.jpl.nasa.gov/ca/
- https://www.jpl.nasa.gov/asteroidwatch/
- https://www.nasa.gov/planetarydefense/

“Deep Dive” Communications

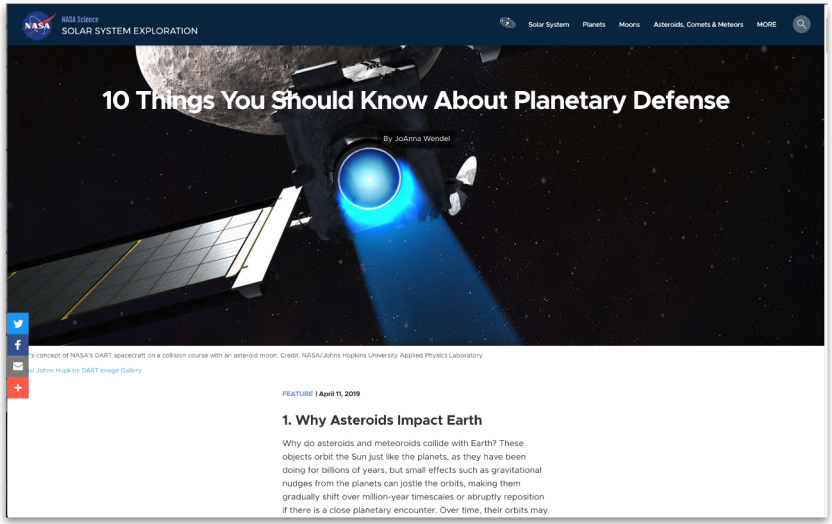
NASA’s Solar System Exploration website and associated social media accounts make planetary science destinations real with “deep dive” content — in-depth and explanatory science writing that provide context. Part of NASA’s Science Mission Directorate digital network, we can reach millions who are not actively seeking planetary defense information.

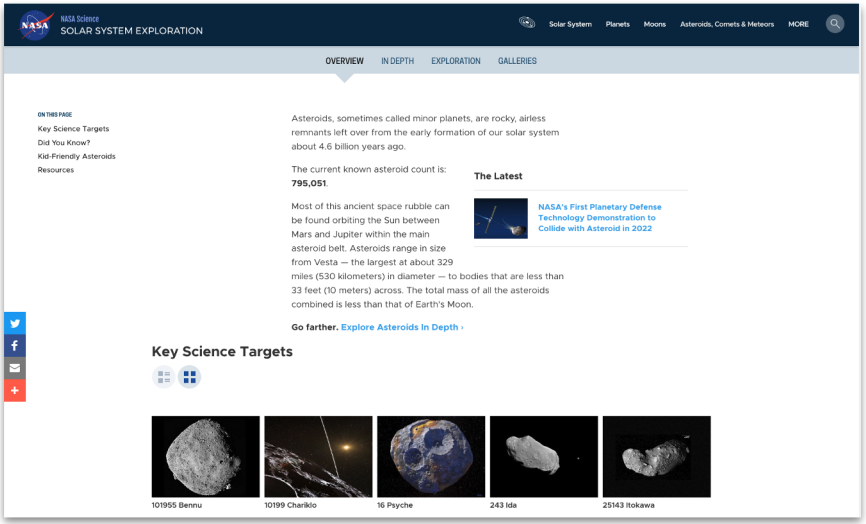


https://solarsystem.nasa.gov
(7 Million Annual Users)



https://www.facebook.com/nasasolarsystem/
(2.9 million Likes)
https://www.instagram.com/nasasolarsystem/
(430,000 Followers)
https://twitter.com/NASASolarSystem
(242,000 Followers)


NASA Science
SOLAR SYSTEM EXPLORATION
Solar System Planets Moons Asteroids, Comets & Meteors MORE
10 Things You Should Know About Planetary Defense
By JoAnna Wendel
's concept of NASA's DART spacecraft on a collision course with an asteroid moon. Credit: NASA/Johns Hopkins University Applied Physics Laboratory
o Johns Hopkins DART Image Gallery
FEATURE | April 11, 2019
1. Why Asteroids Impact Earth
Why do asteroids and meteoroids collide with Earth? These objects orbit the Sun just like the planets, as they have been doing for billions of years, but small effects such as gravitational nudges from the planets can jostle the orbits, making them gradually shift over million-year timescales or abruptly reposition if there is a close planetary encounter. Over time, their orbits may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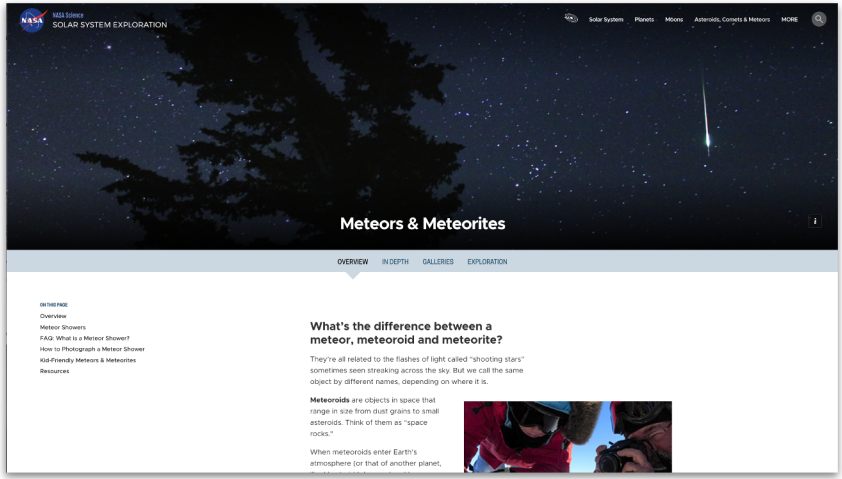
Solar System Planets Moons Asteroids, Comets & Meteors MORE
OVERVIEW IN DEPTH EXPLORATION GALLERIES
ON THIS PAGE
Key Science Targets
Did You Know?
Kid-Friendly Asteroids
Resources
Asteroids, sometimes called minor planets, are rocky, airless remnants left over from the early formation of our solar system about 4.6 billion years ago.
The current known asteroid count is: 795,051.
Most of this ancient space rubble can be found orbiting the Sun between Mars and Jupiter within the main asteroid belt. Asteroids range in size from Vesta — the largest at about 329 miles (530 kilometers) in diameter — to bodies that are less than 33 feet (10 meters) across. The total mass of all the asteroids combined is less than that of Earth's Moon.
Go farther. Explore Asteroids In Depth ›
The Latest
NASA's First Planetary Defense Technology Demonstration to Collide with Asteroid in 2022
Key Science Targets
101955 Bennu
10199 Chariklo
16 Psyche
243 Ida
25143 Itokawa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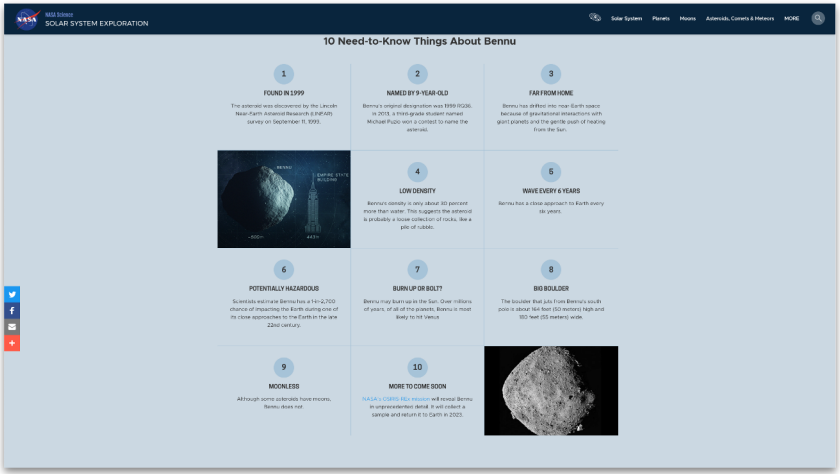
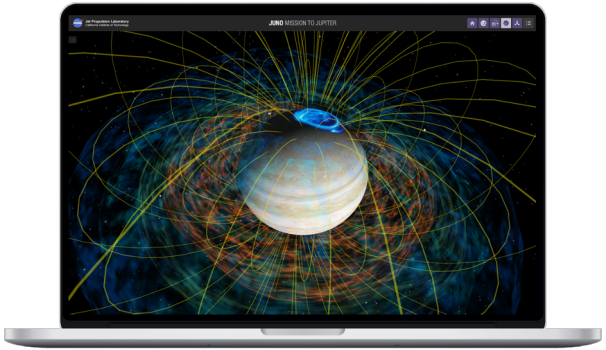
Meteors & Meteorites
OVERVIEW IN DEPTH GALLERIES EXPLORATION
ON THIS PAGE
Overview
Meteor Showers
FAQ: What is a Meteor Shower?
How to Photograph a Meteor Shower
Kid-Friendly Meteors & Meteorites
Resources
What's the difference between a meteor, meteoroid and meteorite?
They're all related to the flashes of light called "shooting stars" sometimes seen streaking across the sky. But we call the same object by different names, depending on where it is.
Meteoroids are objects in space that range in size from dust grains to small asteroids. Think of them as "space rocks."
When meteoroids enter Earth's atmosphere (or that of another planet,

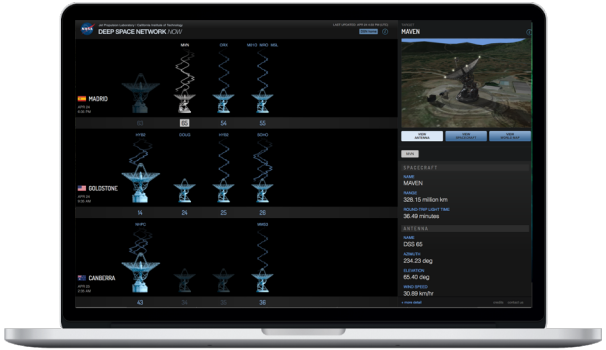

NASA Science
SOLAR SYSTEM EXPLORATION
Solar System Planets Moons Asteroids, Comets & Meteors MORE
10 Need-to-Know Things About Bennu
1
FOUND IN 1999
2
NAMED BY 9-YEAR-OLD
3
FAR FROM HOME
4
LOW DENSITY
5
WAVE EVERY 6 YEARS
6
POTENTIALLY HAZARDOUS
7
BURN UP OR BOLT?
8
BIG BOULDER
9
MOONLESS
10
MORE TO COME SOON

Leveraging NASA Data to Make Space Real

Eyes simulations are a series of real-time, 3D visualizations powered by actual spacecraft data. Versions of the visualizations are available on the web, on mobile devices and via a powerful video game engine.



Juno Mission to Jupiter



Deep Space Network Now

Eyes on the Earth

Eyes on Exoplanets

Spacecraft AR (iOS and Android)

Communicating Science

NASA.gov (green) commands 36% of agency traffic, leading the agency in proving the latest news (Fig. 1).

The Solar System Exploration Website (blue) excels at engaging those seeking more information and context. Fig. 2 compares SSE traffic to the main agency site's "Solar System and Beyond" topic area.

Solar System Exploration content is tailored to meet that desire for a deeper dive.

Figure 1: Sessions
Solar System compared to NASA.gov

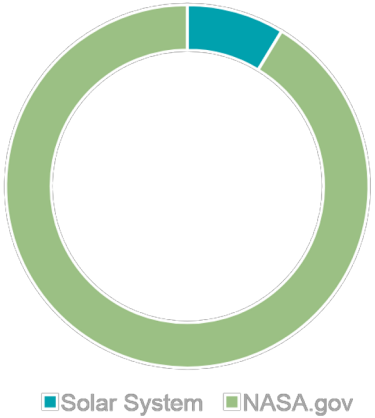
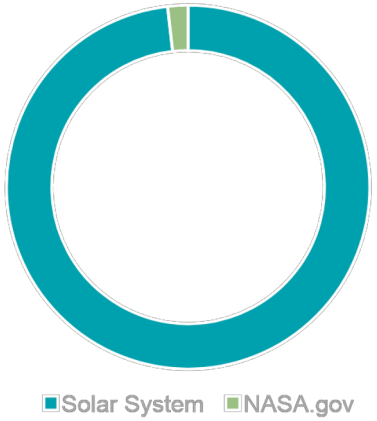


Figure 2: Sessions
Solar System compared to the Solar System and Beyond Theme



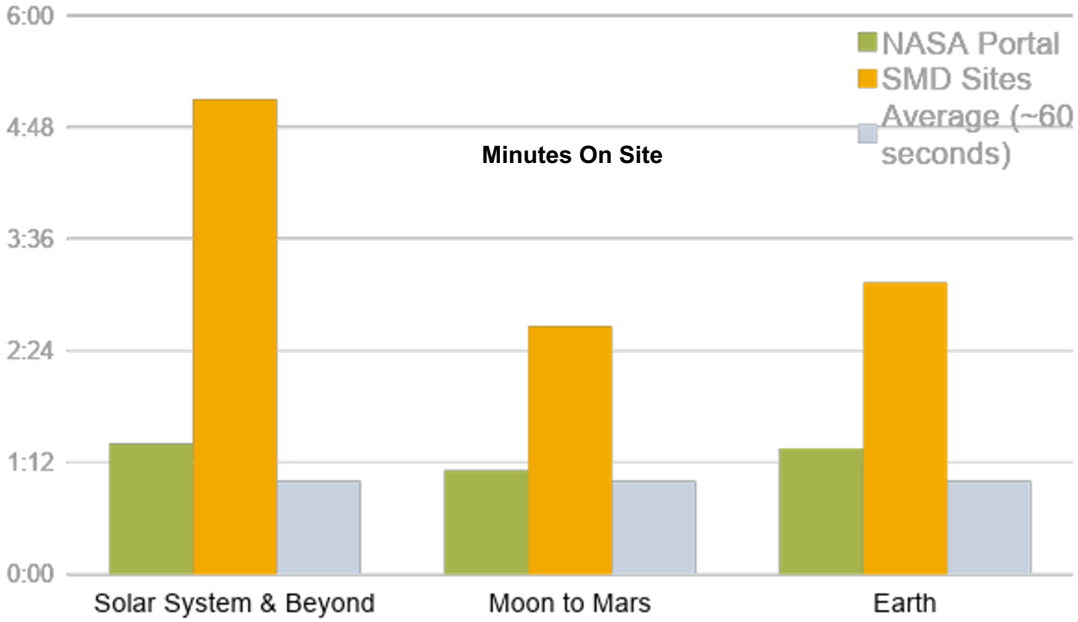
Source: Google Analytics 360, NASA Agency Dashboard, May 9, 2018 May 9, 2019

Communicating Science

Time online is a key metric is measuring quality interactions.

Again, NASA's deep dive sites excel at engagement when compared to industry peers.

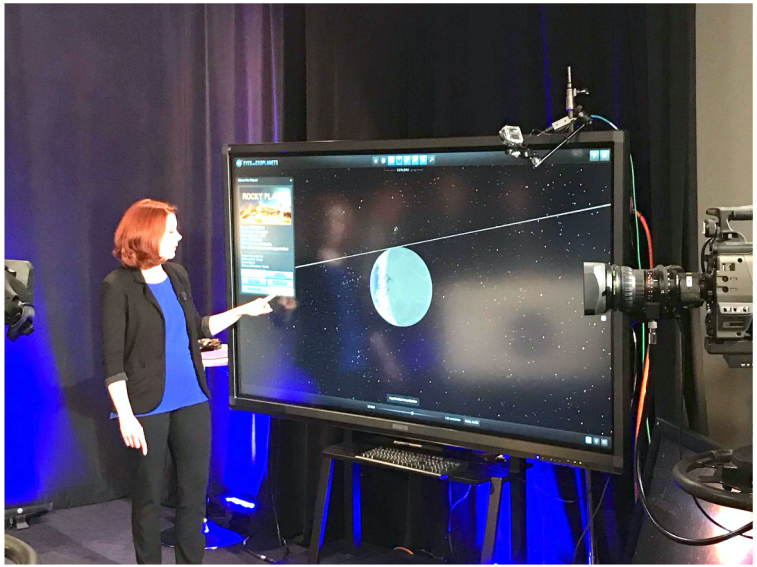
Traffic patterns follow the school year, indicating a large student and teacher audience.



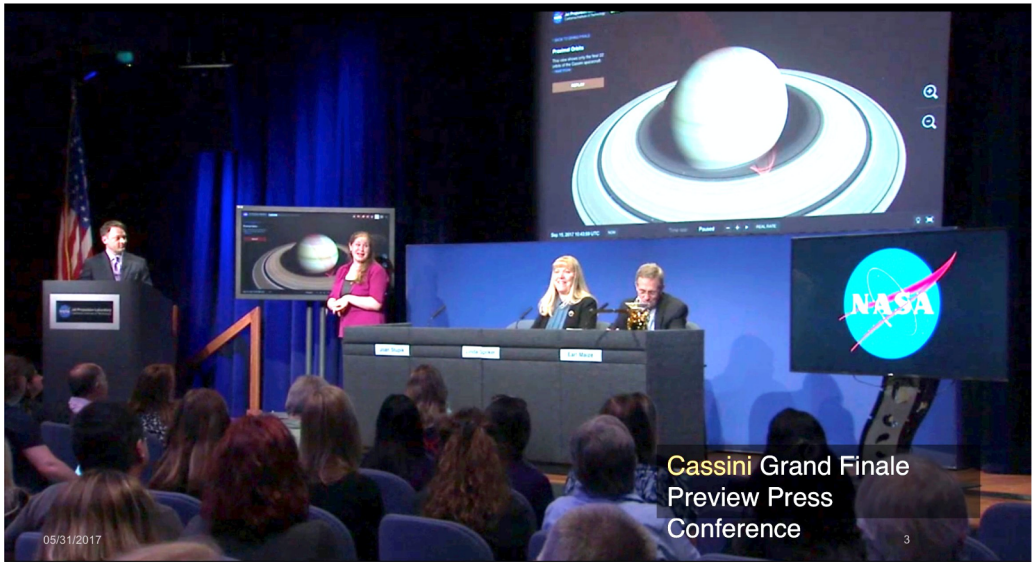
Source: Google Analytics 360, NASA Agency Dashboard

Leveraging NASA Data to Make Space Real

Eyes visualizations was successfully used during live press conferences for both Cassini's Grand Finale and the Trappist-1 exoplanet discovery. The software helped viewers visually understand key science and engineering concepts.



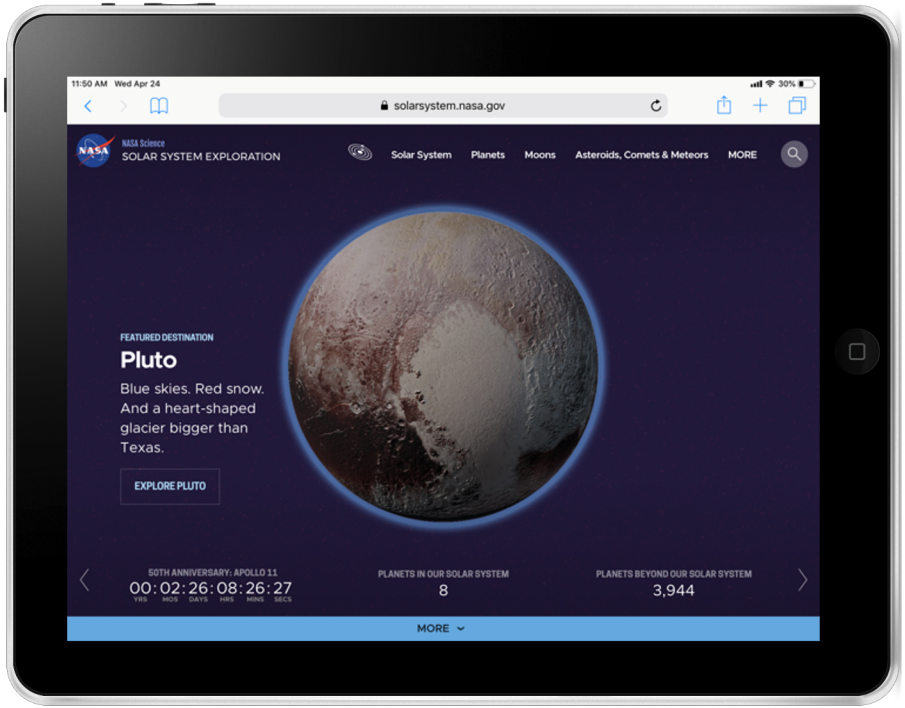
Trappist



Cassini

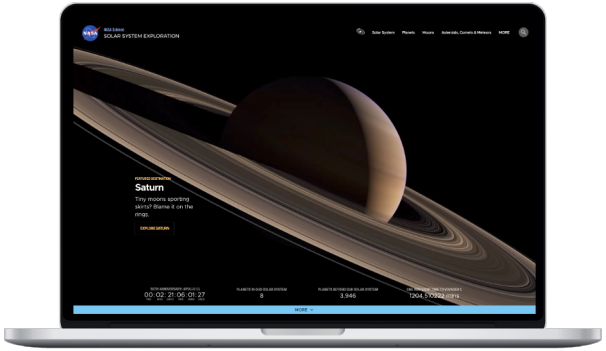
Design and Development: ‘Mobile First’

A responsive, screen-agnostic approach guides all website and interactive development. **Nearly half of all website visitors use mobile devices to view our sites. Most social media is viewed on mobile screens.**

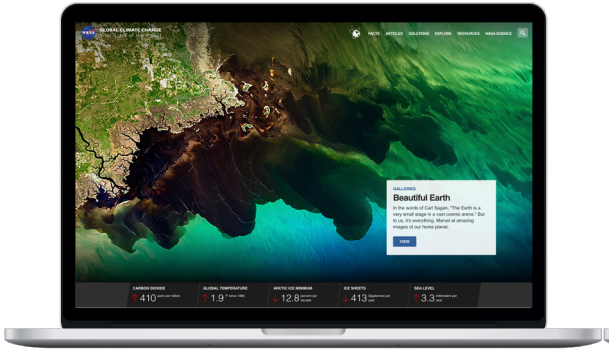


NASA Science Mission Directorate's "Deep Dive" Network

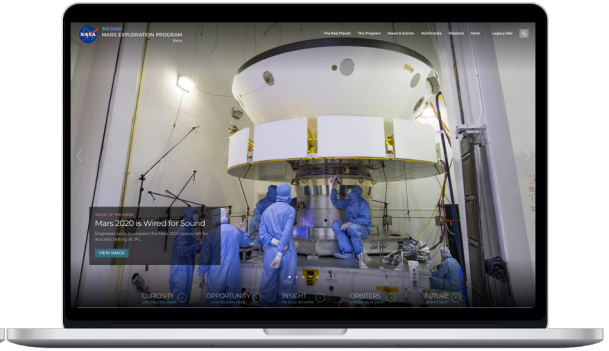
Annual audience of more than 33 million people. Crosscutting, collaborative content can reach an even wider audience.



solarsystem.nasa.gov



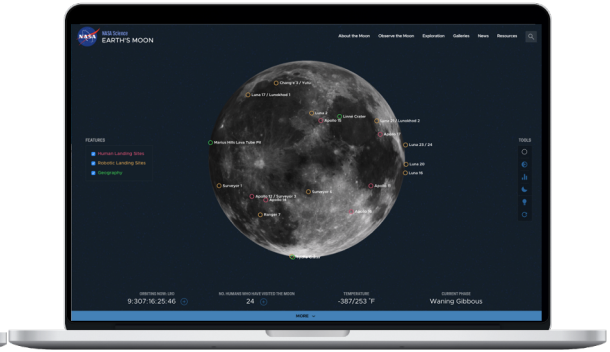
climate.nasa.gov



mars.nasa.gov

spaceplace.nasa.gov

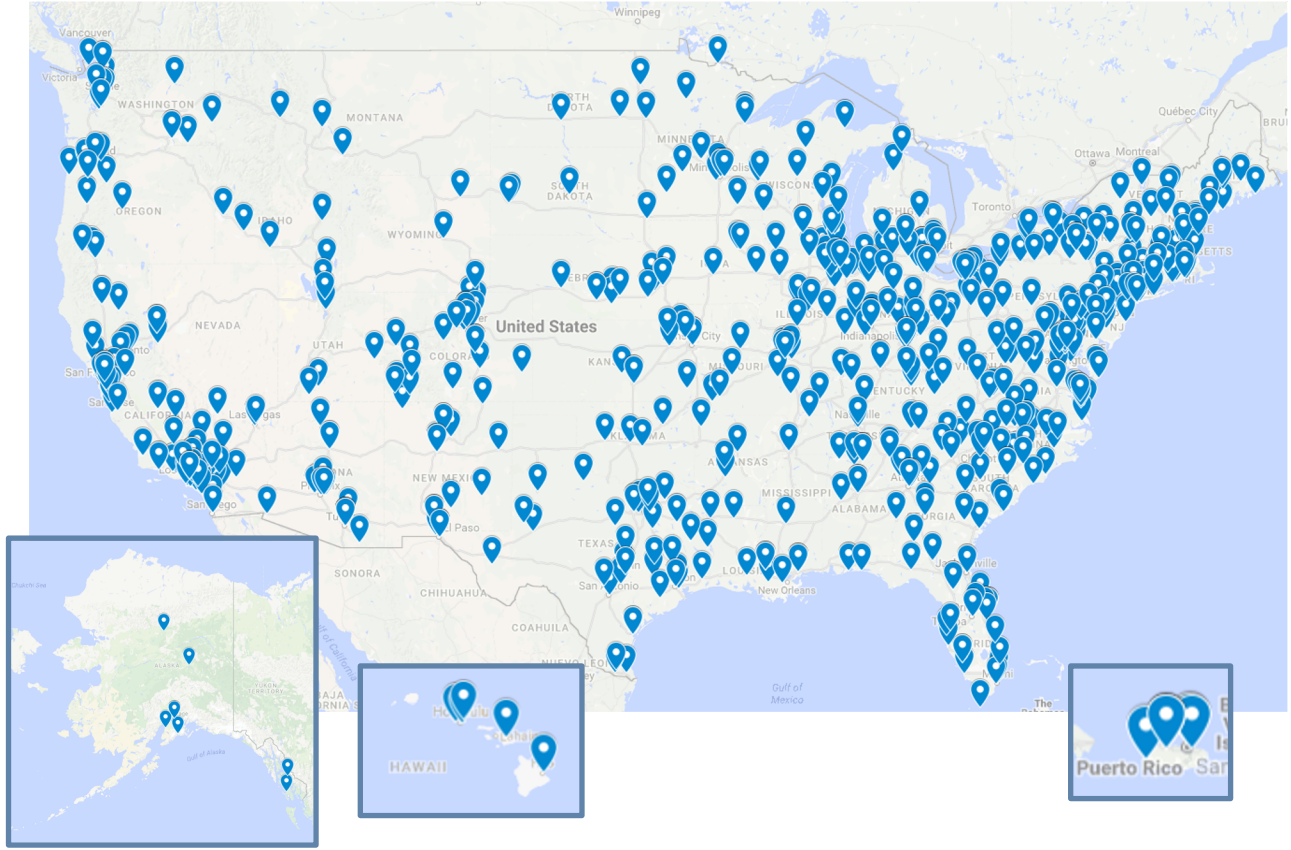
exoplanets.nasa.gov



moon.nasa.gov

Face-to-Face Engagement

NASA's Museum Alliance



2019 Membership

- All **50** states, DC, Puerto Rico
- **38** other countries
- Over **2300** professionals
- Over **1200** organizations

(1071 US, 158 int'l)

Argentina
Australia
Belgium
Brazil
Canada
Chile
Columbia
Costa Rica
Czech Republic
Denmark
Dominican Rep.
Finland
France
Germany
Guatemala
Hungary
Iceland
India
Ireland
Italy
Japan
Malaysia
Mauritius
Mexico
Monaco
Netherlands
Norway
New Zealand
Philippines
Portugal
South Africa
South Korea
Spain
Switzerland
Thailand
Turkey
Ukraine
United Kingdom

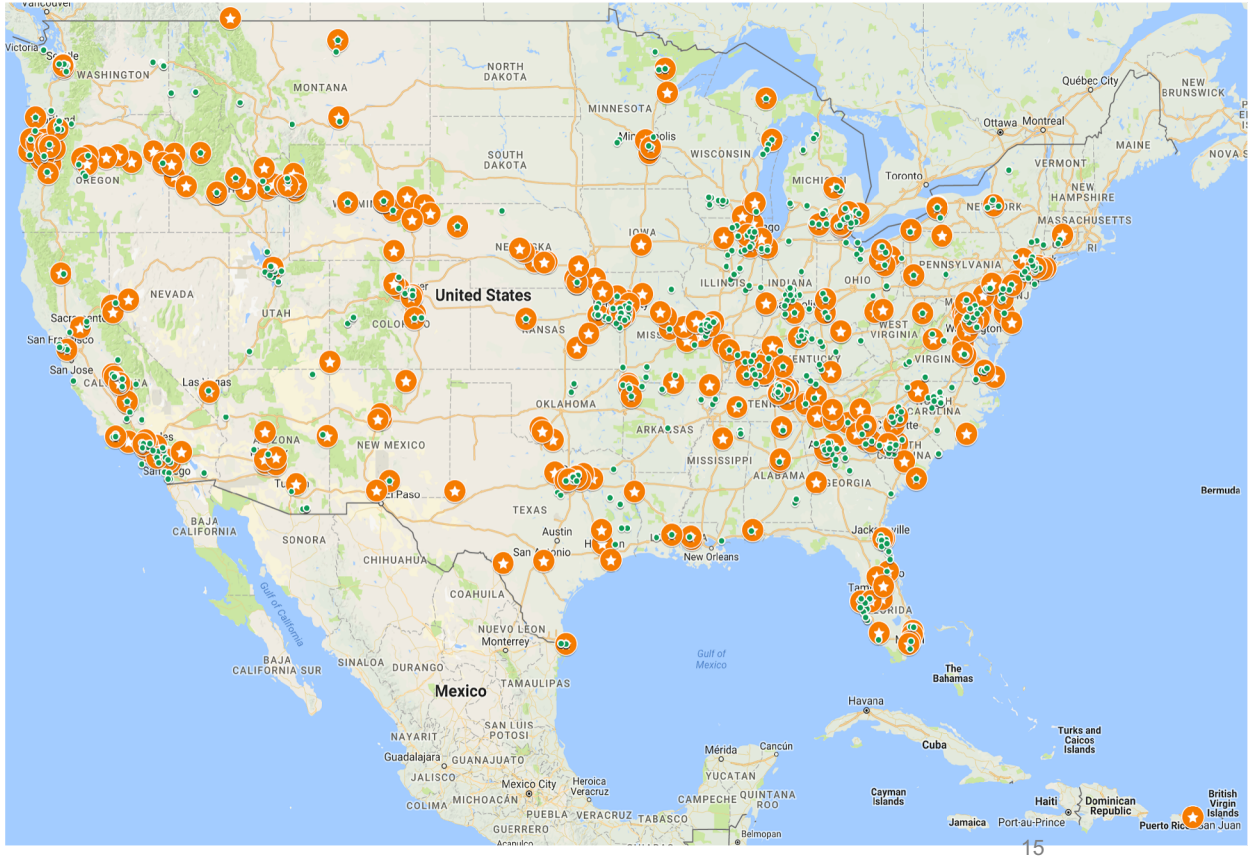
NASA Solar System Ambassadors

Case Study: 2017 Total Solar Eclipse

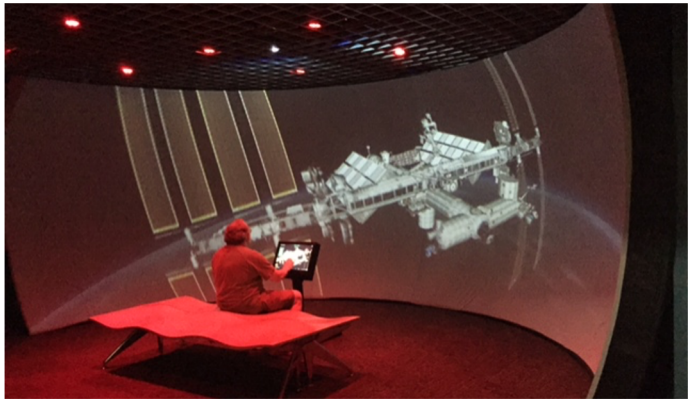
374 eclipse events on August 21st. Directly reached **341k** participants.

Currently, nearly **200** events planned to support Apollo Anniversary for NASA.

1000 volunteers in **all 50 states** and military bases abroad. SSAs receive media and ethics trainings and ongoing monthly science briefings.

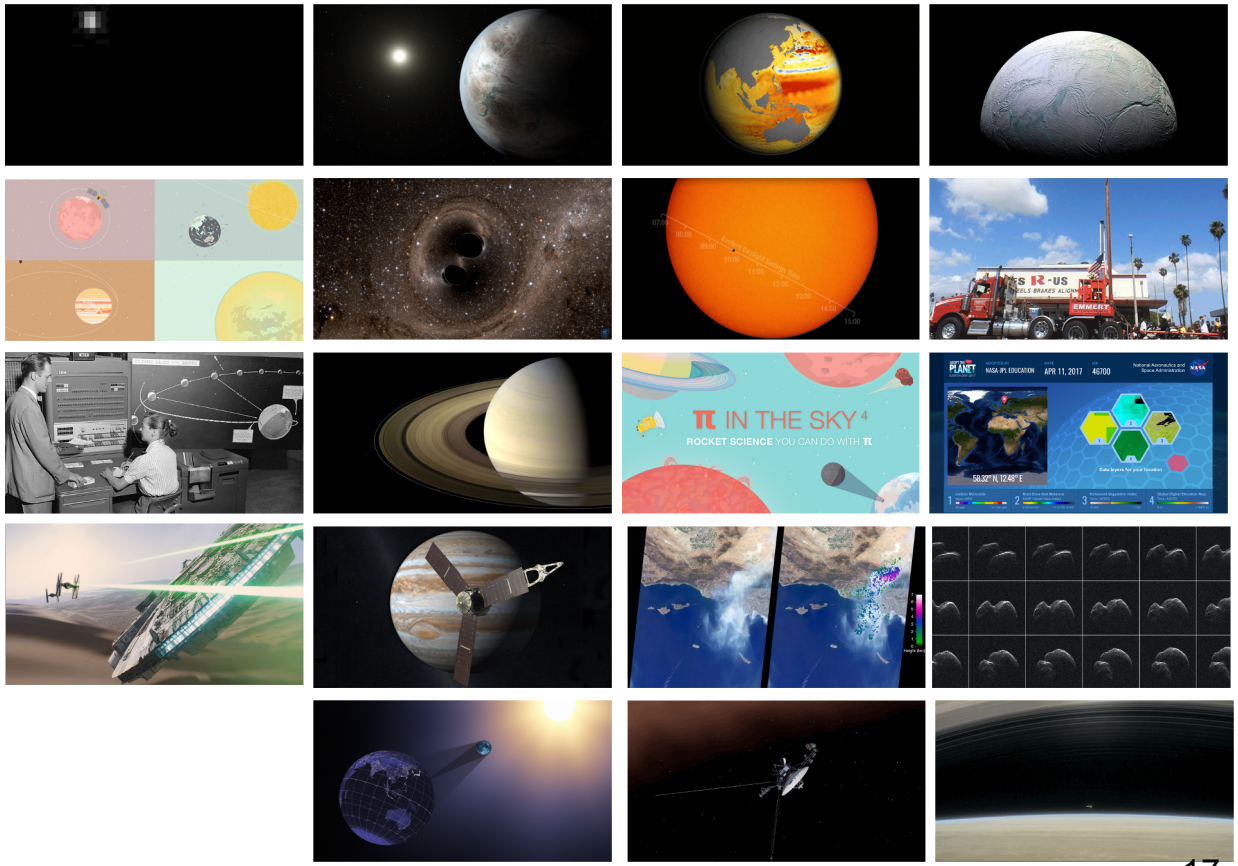


Museum Visualizations



Teachable-Moments Tied to News Events

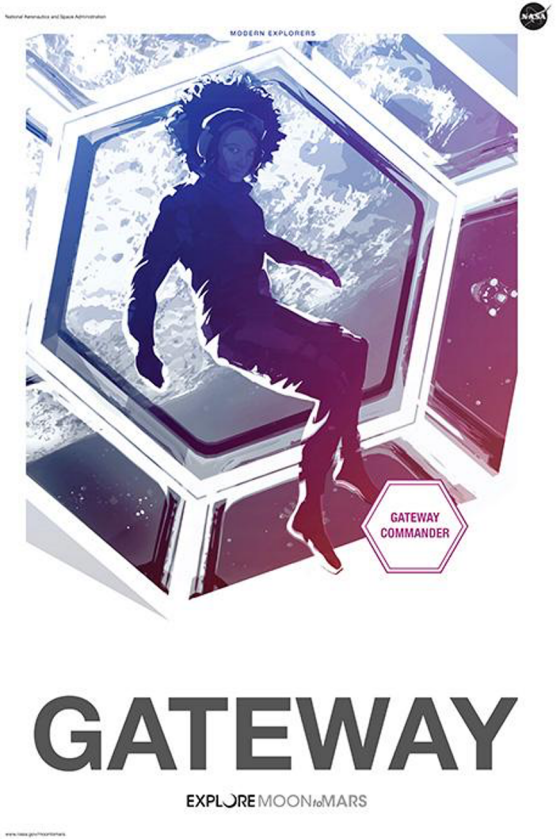
- Written by educators for educators
- Lessons teachers can use immediately
- Provide students with real-world, connections to STEM at NASA
- **400,000** unique pageviews (Since July 2015)



Inspirational Engagement

Aspirational Science-Influenced Art

Aspirational Science-Influenced Art



Art-like Posters of Real Deep Space Destinations


Questions?